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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,489	05/11/2005	Sung Ho Choo	3449-0477PUS1	7114

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EXAMINER	
ARMAND, MARC ANTHONY	
ART UNIT	**PAPER NUMBER**
2814	

NOTIFICATION DATE	DELIVERY MODE
05/20/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/534,489	CHOO ET AL.	
	Examiner	Art Unit	
	MARC ARMAND	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-10 and 53-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-10,53 and 54* is/are rejected.

7)☒ Claim(s) *55-57* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/12/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1,4-10,53-57 in the reply filed on 02/05/2009 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1,4-6,8-10,53 are rejected under 35 U.S.C. 103(a) as being obvious over Hijikata Toshiki et al; (Toshiki) JP 223741; in view of Kim et al., (KR 226831 B) and further in view of Motoki; (Motoki) US 2002/0063258.

Regarding claim 1, Toshiki shows in fig.1, a device having a light device having a GAn- based layer (1)(Para 0015); a high concentration GaN-based layer (3)(Para 0015) formed on the high concentration GaN-based layer; a first metal-Ga (4)(Para 0015) compound layer formed on the high concentration GaN-based layer (3).

Toshiki differs from the claimed invention because he does not explicitly disclose a semiconductor device having a first metal layer formed on the first metal Ga-N compound layer; a third metal-Al compound layer formed on the first metal layer; and a conductive oxidation preventive layer formed on the third metal-Al compound layer.

Kim shows in fig.2b, a device having a first metal layer (16) formed on the first metal Ga-N compound layer (15) (Para 34 and 40).

Kim is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Toshiki because it will provide a device with good conductivity (Para 22). Therefore, at the time the invention was made; it would have been obvious to have a device having a first metal layer formed on the first metal Ga-N compound layer because it will provide a device with good conductivity (Para 22).

Motoki shows in fig.6, a device having a third metal-Al (16) compound layer formed on the first metal layer (22); and a conductive oxidation preventive layer (20) formed on the third metal-Al compound layer (16)(Para 0071).

Motoki is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Toshiki because because it will provide a device capable of enhancing the properties and the yield of GaN-type LEDs (Para 0042). Therefore, at the time the invention was made; it would have been obvious to have a device having a device having a third metal-Al compound layer formed on the first metal layer; and a conductive oxidation preventive layer formed on the third metal-Al compound layer because it will provide a device capable of enhancing the properties and the yield of GaN-type LEDs (Para 0042).

Regarding to claim 4, Motoki shows in fig.6 that the GaN-based layer is P-type or N-type.

Regarding to claim 5, Kim shows in fig.1d a metal layer 8 that is of one selected from the group consisting of Cr.

Regarding to claim 6, Kim shows in fig.1d and discloses (Para 19) wherein the first metal layer is of a metal or compound having a high reactivity with Ga and N.

As for the statement “a high reactivity” it is considered a functional language. Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The layers are formed of the same material; therefore they will have the same properties.

Regarding to claim 9, Kim shows in fig.1d an LED wherein the third metal or a compound not having reactivity with the material forming the conductive oxidation preventive layer

Regarding to claim 10, Kim shows in fig.1d an LED wherein the conductive oxidation preventive layer (7) is of Au.

Regarding claim 53, Kim shows in fig.2c an NP-type light emitting device.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being obvious over Hijikata Toshiki et al; (Toshiki) JP 223741; in view of Kim et al., (KR 226831 B); in view of Motoki; (Motoki) US 2002/0063258 and further in view of Uemura et al., (2003/0107053).

Regarding to claim 7, Toshiki, disclose a device having a metal.

Toshiki modified by Kim and Motoki differs from the claimed invention because he does not explicitly disclose a semiconductor device having third metal selected from the group consisting of Ni, Pt and Pd.

Uemura discloses (Para 0106) an LED having an electrode wherein the metal is of one selected from the group consisting of Ni, Pt and Pd.

Uemura is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Toshiki modified by Kim and Motoki.

Therefore at the time the invention was made, it would have been obvious to one having ordinary skill in the art to replace the material of Uemura (Pt or Pd) electrode with Kim's electrode, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. MPEP 2144.07; and also because it will provide a device with high luminous efficiency (Para 0013).

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being obvious over Hijikata Toshiki et al; (Toshiki) JP 223741; in view of Kim et al., (KR 226831 B); in view of Motoki; (Motoki) US 2002/0063258 and further in view of Nakao et al., (USPAT 5,670,800).

Regarding to claim 8, Toshiki, Kim and Motoki discloses a device having a third metal layer.

Toshiki, Kim and Motoki differ from the claimed invention because they do not explicitly disclose a semiconductor device a metal or compound having a high reactivity with Al.

Nakao shows in fig.2, a device having a metal or compound made of NiInAl, the same material used in the invention; therefore it has a high reactivity with Al (col.7, line 20-25).

Nakao is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Toshiki, Kim and Motoki. Therefore, at the time the invention was made; it would have been obvious to have a semiconductor device a metal or compound having a high reactivity with Al because it

will provide a device with good crystallization and good surface flatness, therefore improving the device (col.7,line 34-30).

8. Claim 54 is rejected under 35 U.S.C. 103(a) as being obvious over Hijikata Toshiki et al; (Toshiki) JP 223741; in view of Kim et al., (KR 226831 B); in view of Motoki; (Motoki) US 2002/0063258 and further in view of Nakao et al., (USPAT 5,670,800) and Williams et al; (Williams) USPAT 5,045,408.

Regarding to claim 54, Toshiki, Kim and Motoki discloses a device having a first and a third metal layer.

Toshiki, Kim and Motoki differ from the claimed invention because they do not explicitly disclose a semiconductor device having the first metal layer that is of one selected from the group consisting of Cr, V and W and the third metal is of one selected from the group consisting of Ni, Pt and Pd.

Nakao shows in fig.2, a device having a metal or compound made of NiInAl, (col.7, line 20-25).

Nakao is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Toshiki, Kim and Motoki. Therefore, at the time the invention was made; it would have been obvious to have a semiconductor device a metal or compound made of NiInAl because it will provide a device with good crystallization and good surface flatness, therefore improving the device (col.7, line 34-30).

William discloses a device having a CrGa intermettalic compound (claim 2).

William is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Toshiki, Kim and Motoki. Therefore, at the time the invention was made; it would have been obvious to have a semiconductor device a CrGa intermettalic compound metal because it will provide a device that is thermodynamically stabilize (col.4, line 35-40).

Allowable Subject Matter

9. Claims 55-57 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not disclose or suggest either in singularly or in combination the following limitations and other elements in the claims:

References Hijikata Toshiki et al; (Toshiki) JP 223741; in view of Kim et al., (KR 226831 B); in view of Motoki; (Motoki) US 2002/0063258 does not disclose:

- A device having a transparent electrode layer formed between the high concentration GaN-based layer and the first metal-Ga Compound layer.

Response to Arguments

10. Applicant's arguments with respect to claims 1-10, 53, 54-57 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARC ARMAND whose telephone number is (571)272-9751. The examiner can normally be reached on 9-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MARC ARMAND/
Examiner, Art Unit 2814

/Wael M Fahmy/
Supervisory Patent Examiner, Art Unit 2814